

## Economics:

1. Economics is the study of how individuals and societies choose to use the scarce resources that nature and previous generations have provided.

Why??

- ① To learn a way of thinking  
opportunity cost: the best alternative that we forgo or give up, when we make a choice or a decision.  
 resources are scarce

Marginalism: process of analyzing the additional or incremental costs or benefits arising from a choice or decision.

Efficient markets: no free lunch:- A market in which profit opportunities are eliminated almost instantaneously.

- ② To understand society

Industrial revolution: late 18<sup>th</sup> & early 19<sup>th</sup> century, new manufacturing technologies and improved transportation gave rise to the modern factory, changes in communication

- ③ To be an informed citizen

major recession b/w 2008 & 2013; to understand everyday govt decisions

The scope of economics: micro & macro economics

Microeconomics: individual industries & economic decisions made by households

Household firms: how resources are distributed among households.

Macroeconomics: economy as a whole: national output, national product, total aggregate employment, how many ppl & jobs exist

Method of economics:

Positive economics: An approach to economics that seeks to understand behaviour and the operation of systems without making judgements. It describes what exists and how it works.

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Normative economics (Policy economics): An approach to economics that analyses the outcomes of economic behaviour, evaluates them as good or bad, and prescribes course of action.

Model: formal statement of theory, a maths statements to show relation between one or two or more variables. (Simplify & abstract from reality)

Variable: measure that change from time to time or from observation to observation. (income: differs from person to person; or for same person at different times is different).

Ockham's razor: the principle that irrelevant detail should be cut away (philosopher william of ockham)

Ceteris paribus or all else equal:- A device used to analyse the relationship b/w two variables while the values of other variables held unchanged. (abstractions).

In much of economics, we are interested in cause and effect.

Post hoc, ergo propter hoc: literally "after this (in time) therefore because of this". A common error made in thinking about causation if event A happens before B, then it is not necessary true that A caused B

Empirical economics: the collection and the use of data to test economic theories. one theory is rejected when it fails to explain what is observed or another theory better explains what is observed.

Macroeconomists: continuously monitor & studying the behaviour of national income at the National Bureau of Economic research. This helps in improving the profitability of the businesses.

Economic policy: Economic theory helps us to learn how the world works. what to change, how & why?

Four criteria helps us in judging the outcomes of economics are  
1. efficiency 2. equity 3. growth 4. stability.

efficiency: allocative efficiency: An efficient economy is one that produces what people want at the least possible cost. adopting new technologies produce the things which low use of resources but of same quality is the efficiency.

equity: fairness: lies in the eye of beholder. implies a fair & more equal distribution of income and wealth. giving ppl what they call

Growth: An increase in total output of an economy. Rural and urban agrarian societies become modern industrial societies as a result of economic growth and rising per capita output.

stability: A condition in which national output is growing steadily with low inflation and full employment of resources. The causes of instability and the ways in which govt have attempted to stabilize the economy are the subject matter of macroeconomics.

Economics is a broad and diverse discipline with many specific fields of inquiry. These include economic history, international economics and urban economics.

2. Economics explores how individuals make choices in a world of scarce resources and how those individual's choices come together to determine three key features of their society.

1. what gets produced 2. How is it produced? 3. who gets what is produced

Capital: things that are produced and then used in the production of other goods and services are called capital resources.

factors of production: basic resources available to a society  
land labour capital

Production: process that transforms scarce resources into useful goods and services.

resources or factors of production are the inputs into the process of production; goods and services of value to households are the outputs of the process of production.

even in a society in which one person is better than second at all tasks, it is still beneficial for the two to specialize and trade.

inputs: Anything provided by nature or previous generations that can be used directly or indirectly to satisfy human wants.

Bill: only person in an island (individual & society are one) still he needs to know how to allocate the island's resources, what to produce, how and when to produce it.

\* Bill must decide what he wants to produce; he must look at the possibilities. resources are limited. food on the top of the list

opportunity cost: cost of leisure is the value of other things he could have produced

Now there is another survivor, "colleen". Now, decision may change same in industrial societies. But here only 2 ppl, us has >300 million ppl

theory of comparative advantage: Ricardo's theory that specialization and free trade will benefit all trading parties even those that may be "absolutely" more efficient producers. members of society benefit by specializing in what they do best has a long history and is one of the most important and powerful ideas in all of the economics.

Bill & colleen → food to eat  
Bill & colleen ← cutting logs to burn. colleen: more logs  
instead colleen is better than Bill both at work. Then he is having an absolute advantage over Bill in both activities

comparative advantage: A producer has a comparative advantage over another in the production of a good or service if he or she can produce that product at a lower opportunity cost.

Producers: who takes resources & transforms them into usable products/outputs.

Bill: produce 8 bushels or 4 logs

To get 8 additional bushels, must give up 4 logs  
Colleen: 10 bushels or 10 logs.

To get 8 additional bushels, must give up 8 logs.

Colleen: more comparative advantage over Bill in production of logs.

Colleen is a better producer than Bill.

If they work together, they produce more food and logs.

Total production increases with some specialization.

By planning: Bill is trading present value for future value weighing present and expected future costs and benefits.

Building capital means trading present benefits for future ones. Resources used to produce capital goods could have been used to produce consumer goods (for present consumption).

Capital is everywhere. (Human capital, car, house, comp program)

Investment: process of using resources to produce new capital

Production possibility frontier (PPF):- A graph that shows all the combinations of goods and services that can be produced if all the society's resources are used efficiently.

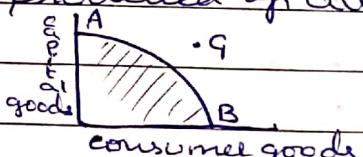
Points that are actually on PPF are of both full resource employment and production efficiency.

In the shaded region, resources are not fully employed.

PPF illustrates no. of economic concepts (opportunity cost)

Negative slope: ratio of change in capital goods to the change in consumer goods. The opportunity cost of the additional capital is the foregone production of consumer goods.

Marginal rate of transformation: value of slope of society's PPF.



Unemployment: unemployment of labour means unemployment of capital. industries run at low capacity. we aren't producing all that we can.

Inefficiency: waste and mismanagement

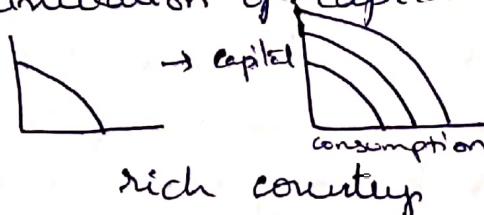
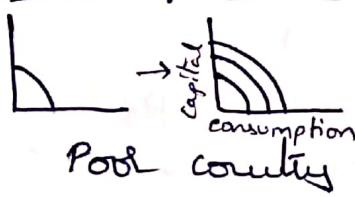
Ex: inefficiency from mislocation of land in farming.

The efficient mix of output: economy must produce what ppl want. output efficiency (from PPF) Beef ex:

Economic growth: characterised by an increase in the total output of an economy. Improved productivity also comes with innovation and technological change, discovery & application of the new.

Growth occurs when a society acquires new resources or when it learns to produce more using existing resources.

Sources of Growth: accumulation of capital & technological advances



Economic problem: amount of coordination and co-operation understand the central difference in the way command economies and market economies decide what to produce.

Command economies: An economy in which a central govt either directly or indirectly sets output targets, incomes and prices.

Laissez-faire economies: The free market "allow(s) them to do". An economy in which individual ppl and firms pursue their own self-interest without any govt direction or regulation.

Market: the institution through which buyers and sellers interact and engage in exchange.

Consumer sovereignty: the idea that consumers ultimately dictate what will be produced by choosing what to purchase. Business rise and fall in response to consumer demands.

Individual production decisions: free enterprise; more efficient production and better response to diverse and changing consumer preferences. competition forces producers to use efficient techniques of production and to produce goods what consumers want.

Distribution of output: who gets what.

Price theory: Prices of inputs (land, labour and capital) determines how much it costs to produce a product.

Mixed systems, markets and govt's

what the market does well, where it potentially fails and exploring the role of govt in dealing with market failure

5 Model of supply and demand tells us a good deal about how a change in price of a good affects behaviour.

In business and in govt, the ability to analyse the large data sets is the key to improved decision making.

Economists measure responsiveness using the concept of elasticity: A general concept used to quantify the response in one variable when another variable changes. (Is preferable as a measure of responsiveness to slope and how to measure it).

Price elasticity of demand: downward slope of demand curve  
The ratio of % change in quantity demanded to the % change in prices.  
$$= \frac{\% \text{ change in quantity demanded}}{\% \text{ change in price}}$$
 (-ve ratio always).

Types of elasticity: (elasticity 0 to  $\infty$ )

A demand curve with an elasticity of '0' is called perfectly inelastic. A demand curve in which even the smallest price ↑ reduces quantity demanded to zero is perfectly elastic demand.

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Price

	insulin	Perfectly inelastic	Price	wheat	Perfectly elastic
demand			demand		

elastic demand: A demand relationship in which the % change in quantity demanded is larger than the % change in price in absolute value (demand elasticity with an absolute value > 1)

Inelastic demand: Demand that responds somewhat, but not a great deal, to change in price. (always has a numerical value b/w 0 and 1)

unitary elasticity: A demand relationship in which the % change in quantity of a product demanded is the same as the % change in price in absolute value (a demand elasticity with an absolute value 1)

calculating elasticities:-

$$\% \text{ change in quantity demanded} = \frac{\text{change in quantity demanded}}{Q_1} \times 100\%$$

$$= Q_2 - Q_1 / Q_1 \times 100\%$$

$$\% \text{ change in price} = \frac{\text{change in price}}{P_1} \times 100\% = \frac{P_2 - P_1}{P_1} \times 100\%$$

Price elasticity of demand

$$= \% \text{ change in quantity demanded}$$

% change in price unitary 1

If demand is elastic elasticity > 1; inelastic 0 < 1 b/w

mid point formula:- A more precise way of calculating % using the halfway b/w  $P_1$  and  $P_2$  for the base in calculating the % change in price and the value halfway b/w  $Q_1$  and  $Q_2$  as the base for calculating the % change in quantity demanded.

Point elasticity: A measure of elasticity that uses the slope

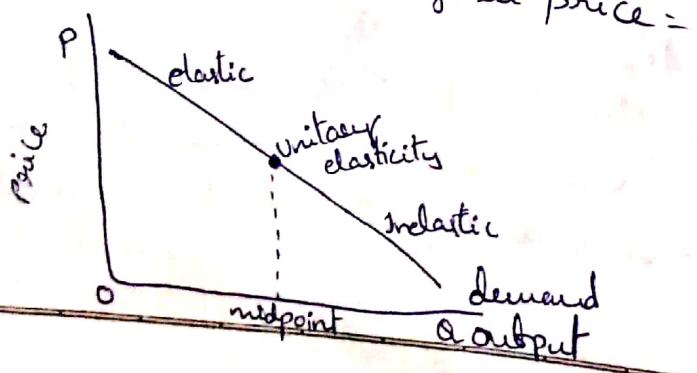
$$\frac{\Delta Q / Q_1}{\Delta P / P_1} = \frac{\Delta Q}{\Delta P} \cdot \frac{P_1}{Q_1} \quad \frac{\Delta Q}{\Delta P} = \text{reciprocal of slope}$$

mid point

$$\% \text{ change in demand} = \frac{Q_2 - Q_1}{Q_1 + Q_2 / 2} \times 100\%$$

$$\% \text{ change in price} =$$

$$P_2 - P_1 / (P_1 + P_2 / 2) \times 100\%$$



demand of oil is more inelastic than is the demand for bananas

Total revenue = price  $\times$  quantity

effect of price changes on quantity demanded  
 $P \uparrow - Q_D \downarrow$   
 $P \downarrow - Q_D \uparrow$

effect of price increase on a product with inelastic demand  
 $P \uparrow \times Q_D \downarrow = TR \downarrow$

effect of price increase on a product with elastic demand  
 $P \uparrow \times Q_E \downarrow = TR \downarrow$

effect of price cut on a product with elastic demand  
 $P \downarrow \times Q_E \uparrow = TR \uparrow$

effect of price cut on a product with inelastic demand  
 $P \downarrow \times Q_D \uparrow = TR \uparrow$

Availability of substitutes affects demand elasticity.

Luxury goods: elastic demand; Necessities: inelastic demand  
Income elasticity of demand: A measure of the responsiveness of quantity demanded to changes in income.

$$= \frac{\% \text{ change in quantity demanded}}{\% \text{ change in income}}$$

Cross-price elasticity of Demand: A measure of response of the quantity of one good demanded to a change in price of another good.  
 $= \frac{\% \text{ change in quantity of } Y \text{ demanded}}{\% \text{ change in price of } X}$

Elasticity of supply: A measure of the response of quantity of a good supplied to a change in price of that good. Likely to be positive in output markets  
 $= \frac{\% \text{ change in quantity supplied}}{\% \text{ change in price}}$

Elasticity of labor supply: A measure of the response of labor supplied to a change in the price of labor  
 $= \frac{\% \text{ change in quantity of labor supplied}}{\% \text{ change in wage rate}}$

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... being a recipient.

Excise tax: A per unit tax on a specific good.

Govt should find a less elastic product to tax  
elasticity of demand determines in part how the imposition of  
an excise tax will affect consumers, suppliers and the final  
revenue raised from the tax.

3. Markets are the institutions where through which exchange typically takes place understand the role of firms, entrepreneurs and households in the market.

firms: the primary producing units in the economy.  
An organisation that transforms resources (inputs) into products (outputs). Firms are the primary producing units in a market economy. mostly firms exists to make a profit. But some may not (education).

entrepreneurs: A person who organizes, manages and assumes the risk of a firm, making a new idea or a new product and turning it into a successful business.

Households: The consuming units in the economy.  
In output markets , firms supply and households demand

Product or output markets: The markets in which goods and services are exchanged.

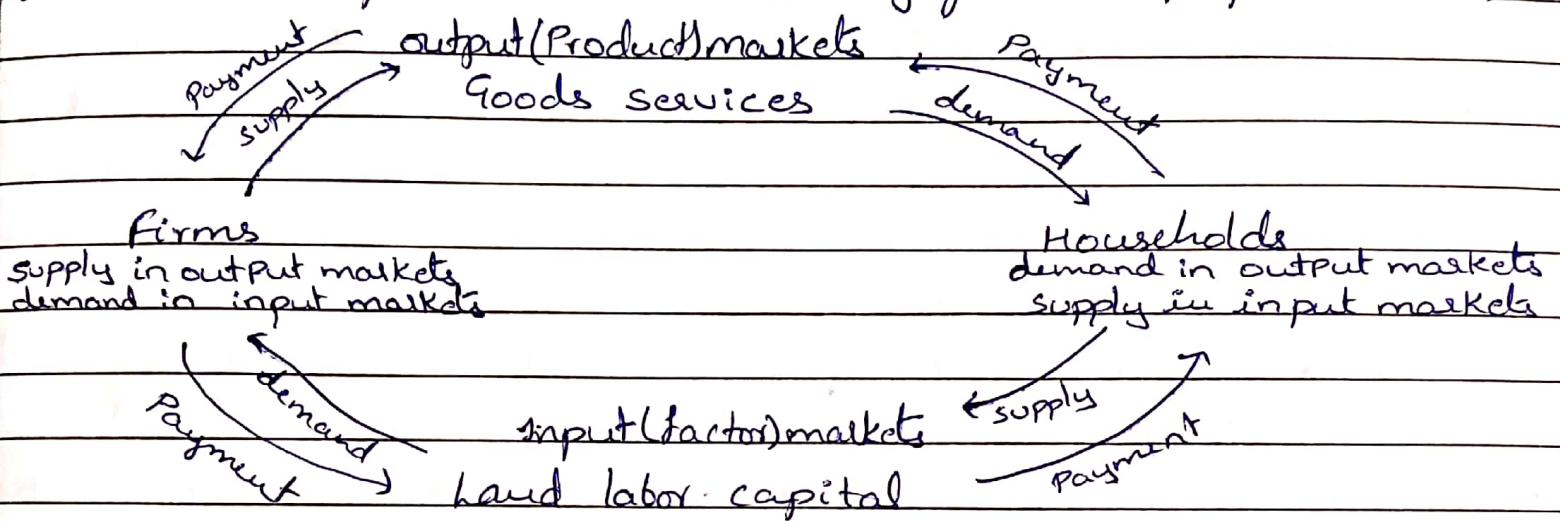
input or factor markets: The markets in which the resources used to produce goods and services are exchanged.

labor market: The input/factor market in which households supply work for wages to firms that demand labor.

capital market: The input/factor market in which households supply their savings, for interest or for claims to future profits to firms that demand funds to buy capital goods.

land market: The input/factor market in which households supply land or other real property in exchange for rent.

factors of production: the inputs into the production process. Land, labor and capital are the three key factors of production.



Demand in product/output markets: what to buy depends on

1. price of the product
2. income available
3. amount of accumulated wealth
4. Prices of other products available to household
5. tastes and preferences.
6. expectations about future income, wealth and prices

Quantity demanded: the amount (no of units) of a product that a household would buy in a given period if it could buy all it wanted at the current market price.

Changes in the price of a product affect the quantity demanded per period. Changes in any other factor, such as income or preferences, affect demand.

Demand schedule: shows how much of a given product a household would be willing to buy at different prices for a given time period.

Demand curve: the relationship b/w price (P) and quantity

demanded (2) presented graphically is called a demand curve.  
A graph illustrating how much of a given product a household would be willing to buy at different prices.  
When price rises, quantity demanded falls. & vice-versa.

law of demand: The negative relationship b/w price and quantity demanded. As price falls, quantity demand increases during a given period of time, all other things remaining constant. demand curves have a -ve slope :- A ↑ in price is likely to lead to a decrease in quantity demanded and a ↓ in price is likely to lead to an ↑ in quantity demanded.

They intersect X axis (Quantity) : a result of time limitations and diminishing marginal utility.

They intersect Y axis (Price) : a result of limited income & wealth

income and wealth: The sum of all a household's wages, salaries, profits, interest payments, rents & other forms of earnings in a given period of time. It is a flow measure

wealth: The total value of what a household owns minus what it owes. It is a stock measure

normal goods: Goods on which demand goes up when income is higher and for which demand goes down when income is lower.

inferior goods: goods for which demand tends to fall when income rises.

substitutes: Goods that can serve as replacements for one another when the price of one ↑, demand for the other ↑

Perfect substitutes: identical products

complements / complementary goods: Goods that "go together". A decrease in the price of one results in an increase in demand for the other and vice-versa.

But final choice depends on individual tastes and preferences.

Expectations: what you decide to buy today certainly depends on today's prices and your current income and wealth. Also have expectations about what your position will be in the future.

Shift of demand vs movement along a demand curve:

If demand increased when income also increased, implies it becomes a normal good.

The change that takes place in a demand curve corresponding to a new relationship b/w quantity demanded of a good and price of that good. The shift is brought about by a change in the original co-ordinates.

Movement along a demand curve: The change in quantity demanded brought about by a change in price.

Change in price of a good or service leads to

↳ Change in quantity demanded (movement along a demand curve)  
↳ Change in income, preferences or prices of other goods/services (leads to change in demand (shift of a demand curve)).

Market demand: The sum of all the quantities of a good or service demanded per period by all the households buying in the market for that good or service.

Supply in market/output products: Profit is the difference b/w revenues and costs.

Quantity supplied: The amount of a particular product that firms would be willing and able to offer for sale at a particular price during a given time period.

Supply schedule: It shows how much of a product firms will sell at alternative prices.

Law of supply: The relationship b/w price and quantity of a good supplied. An increase in market price, ceteris paribus

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will lead to an ↑ in quantity supplied, and a ↓ in market price

will lead to a ↓ in quantity supplied.

Supply curve: A graph illustrating how much of a product a firm will sell at different prices.

Cost of production: depends on many inputs, technology. (machines)  
a firm's decision about what to supply depends on  
1. Price of that good or service  
2. The cost of producing the product → technologies used to produce that  
3. Price of related products.

Movement along a supply curve: The change in quantity supplied brought about by a change in price.

Shift of a supply curve: The change that takes place in a supply curve corresponding to a new relationship between quantity supplied of a good and the price of that good.

The shift is brought about by a change in the original conditions all producers of a single product.

Market supply: the sum of all that is supplied each period by Market that is not in equilibrium responds to restore an equilibrium

Equilibrium: The condition that exists when quantity supplied and quantity demanded are equal. At equilibrium, there is no tendency for price to change.

Excess demand or shortage: The condition that exists when quantity demanded exceeds quantity supplied at the current price. Price rise above two things happen:  
choose a substitute

the quantity supplied increases as farmers find themselves receiving a higher price for their products.

Price rationing: when quantity demand exceeds supply price ↑ until an equilibrium is reached where demand equals to supply.

excess supply or surplus: the condition that exists when quantity supplied exceeds quantity demanded at the current price.

mechanics of supply and demand in product markets

1. A demand curve shows how much of a product a household would buy if it could buy all it wanted at the given price.

A supply curve shows how much of a product a firm would supply if it could sell all it wanted at given price.

2. Quantity demanded and quantity supplied are always per time period - that is, per day, per month or per year.

3. The demand for a good is determined by price, household income and wealth, prices of other goods and services, tastes and preferences and expectations.

4. The supply of a good is determined by price, costs of production & prices of related products, costs of production are determined by available technologies of production & input prices.

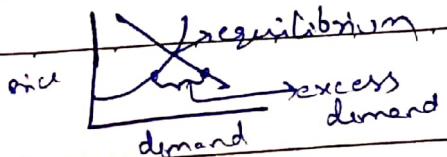
5. Be careful to distinguish b/w movements along supply and demand curves and shifts of these curves. When the price of good changes, the quantity of good demanded or supplied changes - that is, a movement occurs along the curve. When any other factor that affects supply or demand changes, curve shifts & position change.

6. Market equilibrium exists only when quantity supplied equals demanded at the current price.

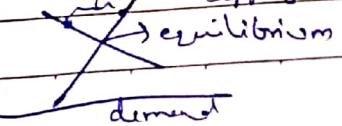
Decisions of independent firms respond to prices and profit opportunities determine what will be produced.

"individual invisible hand" - Adam Smith.

"Every individual... by pursuing his own interest... promotes that of society. He is led... by an invisible hand to promote an end which was no part of his intention."



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+ there being a gap

6 Decisions involve a time element. Household decisions about labor supply and job choice are clearly constrained by availability of jobs and the existing structure of market wages.

Budget constraint: the limits imposed on household choices by income, wealth and product prices. (income, wealth & prices).

choice set or opportunity set: the set of options that is defined and limited by a budget constraint

A budget constraint separates those combinations of goods and services that are available, given limited income, from those that are not. The available combinations make up the opportunity set.

real income: the set of opportunities to purchase real goods and services available to a household as determined by prices and money income.  $P_x X + P_y Y = I$   $Y$ : quantity of  $Y$  consumed  $I$ : household income.

$P_x$ : price of  $X$   $P_y$ : Price of  $Y$   $X$ : quantity of  $X$  consumed

When a price of good decreases, the budget constraint swivels to the right, increasing the opportunities available and expanding choice.

utility: the satisfaction a product yields

law of diminishing marginal utility: the more of any one good consumed in a given period, the less satisfaction (utility) generated by consuming each additional (marginal) unit of the same good.

Marginal utility: the additional satisfaction gained by the consumption or use of one more unit of a good or service  $MU = 0$   $TU$  stops rising.

Total utility: the total satisfaction of a product yields.

utility-maximizing rule:  $\frac{MU_x}{P_x} = \frac{MU_y}{P_y}$   $MU_x$ : marginal utility derived from last unit of  $x$  consumed

Diamond/water paradox: A paradox stating that 1. the things with the greatest value in use frequency have little or no value in exchange

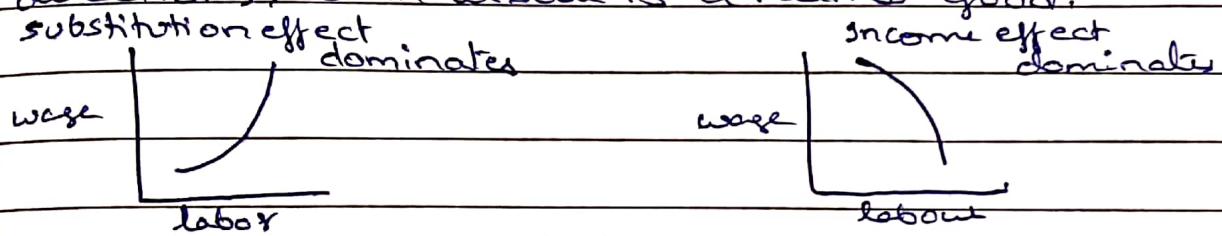
2. The things with the greatest value in exchange frequently have little or no value in use

income effect: The change in consumption of the original product due to this improvement in well-being or you feeling richer is called the income effect of a price change.

Substitution effect: A fall in price of product X might cause a household to shift its purchasing pattern away from substitute towards X. wage rate is the price of leisure.

labor supply curve: A curve that shows the quantity of labor supplied at different wage rates. Its shape depends on how households react to changes in the wage rate.

In labor market, income and substitution effects work in opp directions, when leisure is a normal good.



financial capital market: the complex set of institutions in which suppliers of capital (households that save) and the demand for capital (firms wanting to invest) interact.

7. Production process: demand factors of production in input markets and supply goods and services in output markets  
 All firms, whether competition is not, demands inputs, engage in production and produce outputs. All firms have an incentive to maximize profits and thus to minimize costs.

Production: the process by which inputs are combined, transformed and turned into outputs

firm: An organisation that comes into being when a personal or a group of people decides to produce a good or service to meet a perceived demand. Primary objective - max profits.

1. How much output to supply
2. Which production technology to use
3. How much of each input to demand

A profit-maximizing firm chooses the technology that minimizes its cost for a given level of output.

Profit = total revenue - total cost.

Total revenue: amount received from the sale of the product. (ex)

Total cost (economic): out of pocket costs + opportunity cost for all factors of production (implicit)

Normal rate of return: A rate of return on capital that is just sufficient to keep owners and investors satisfied. For relatively risk-free firms, it should be nearly the same as the interest rate on risk-free govt bonds.

If the level of profit is positive, the firm is earning an above-normal rate of return on capital.

Profit = 1,000

Total revenue: 30,000 (3000 x 10) Costs: 15,000 (3000 x 5)

Labour cost: 16,000, ~~20,000~~: Capital

If they use this to purchase corporate bond with 10% interest

$20,000 \times 10 = 2,000$ . This is more than 1,000. Loss of ~~1,000~~

They are earning below-normal return.

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decisions made by a firm: how much to produce, how to produce and what inputs to demand.

short run: the period of time for which two conditions hold: the firm is operating under a fixed scale (fixed factors) of production and firms can neither enter nor exit an industry.

long run: the period of time for which there are no fixed factors of production: firms can ↑ or ↓ the scale of operation and new firms can enter and existing firms can exit the industry.

A firm needs to know three things:

1. Market price of output
2. Techniques of production available
3. Price of input factors

optimal method of production: the production method that minimizes cost.

Price of output  
↓  
total revenue

production techniques

input prices

total cost & optimal method of production

$$\text{Total profit} = \text{total revenue} - \text{total cost with optimal method}$$

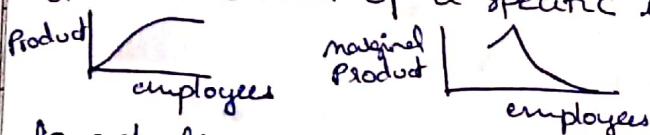
Production technology: the quantitative relationship between inputs and outputs.

labor-intensive technology: Technology that relies heavily on human labor instead of capital.

capital-intensive technology (labor-saving techniques): Technology that relies heavily on capital instead of human labor.

Production function or total product function: A numerical or mathematical expression of a relationship b/w inputs and outputs. It shows units of total product as a function of units of inputs.

Marginal product: the additional output that can be produced by adding one more unit of a specific input, ceteris paribus (all else equal).



diminishing returns are setting in, not b/c 3rd worker is worse than one/2, each has a

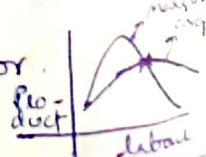
law of diminishing returns: when additional units of a variable input are added to fixed inputs, after a certain point, the marginal product declines.

Product of the variable input declines.

Average product: the average amount produced by each unit of a variable factor of production avg product of labor:  $\frac{\text{total product}}{\text{total units of labor}}$

If marginal > avg: avg ↑ vice versa.

marginal ↓, avg also ↓ but more slowly



capital and labor are complementary units.

Added capital raises the productivity of labor, that is, the amount of output produced per worker per hr. Building new, modern plants and equipment enhances a nation's productivity.

Social learning obviously plays a role in the diffusion of manufacturing technology as well. Many high-tech entrepreneurs began their careers in other high-tech firms where they learned much about the right production techniques. Inputs can be substituted for one another. One of the key decisions that all firms must make is which technology to use.

The flexibility of a firm's techniques of production is an important determinant of its costs. Two things determine the cost of production: 1. technologies that are available 2. input prices. Profit-maximizing firms will choose the technology that minimizes the cost of production given current market input prices.  $\Rightarrow$  optimal technology. With more than one input, the choice of technologies often depends on the unit cost of those inputs.

\* firms vary in size and internal org, all take inputs & transforms to output: process called Production.

Perfect competition, no single firm has any control over prices.

1. each firm produces homogeneous products 2. many firms.

Demand curve facing a competitive firm is perfectly elastic.

8. firms make 3 specific decisions.

1. How much to supply 2. How to produce 3. Quantity of each input to demand  
Focus on costs of production

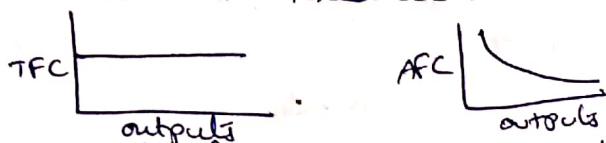
Firms look to output markets for the price of output and to input markets for the prices of labor & capital

decisions are based on information  
 quantity of output to supply → price of output  
 Produce that output → techniques of production available  
 each input to demand → price of inputs

fixed cost: Any cost that does not depend on the firm's level of output. These costs are incurred even if the firm is producing nothing. There are no fixed costs in the long run.

Variable cost: A cost that depends on the level of production chosen.

Total costs = Total fixed costs + total variable costs.



TFC: total fixed costs

AFC: Avg fixed costs

$$TC = TFC + TVC$$

TFC or overhead: the total of all costs that don't change with output even if output is zero. Fixed costs do not come into decision process.

AFC: total fixed cost divided by no of units of output, a per-unit measure of fixed costs. FC don't change when output changes

spreading overhead: the process of dividing total fixed costs by more units of output. Avg fixed cost declines as quantity rises.

Total variable cost: the total of all costs that vary with output in the short run.

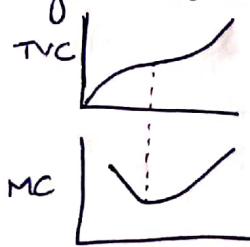
TVC curve: A graph that shows the relationship b/w total vc & level of a firm's output. TVC depends on 1. techniques of production available 2. Prices of inputs required by each technology.



Marginal cost: the increase in total cost that results from producing 1 more unit of output. Marginal costs reflect change in variable costs each additional unit of output costs more to produce.

In short run, every firm is constrained by some fixed input that

1. leads to diminishing returns to variable inputs
  2. limits its capacity to produce. As firm approaches that capacity, it becomes increasingly costly to produce successive higher levels of output.
- Marginal costs ultimately ↑ with output in short runs.

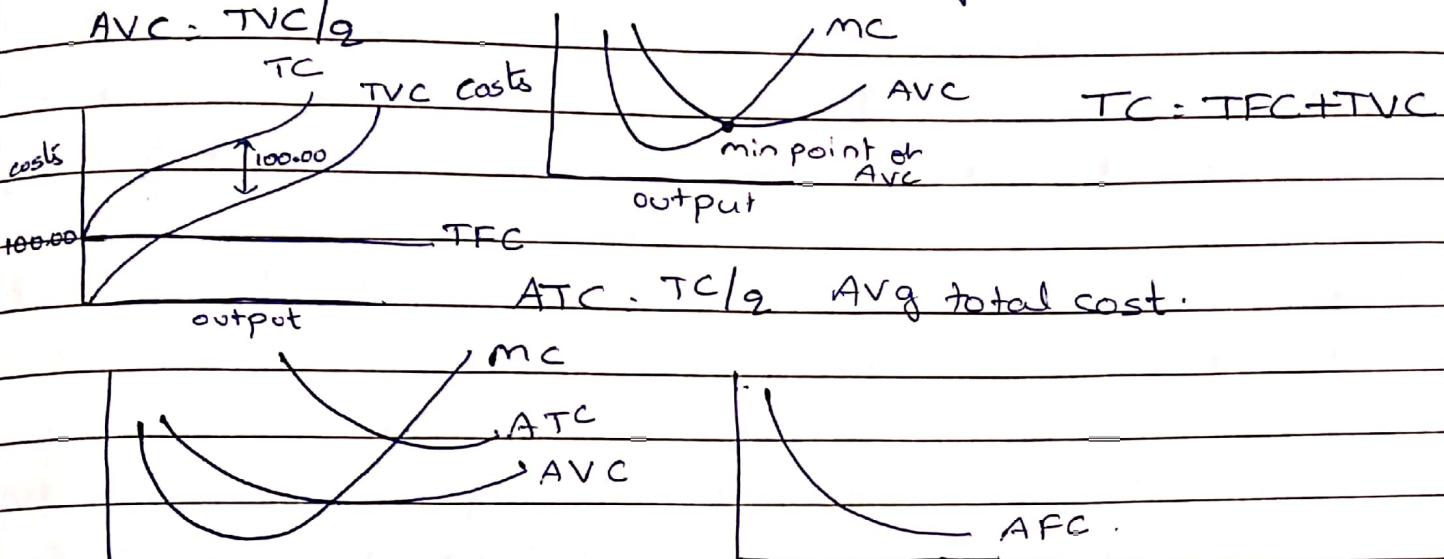


Marginal cost actually is the slope of the total variable cost curve:

$$\text{slope of TVC} = \frac{\Delta TVC}{\Delta Q} = \frac{\Delta TVC}{1} : \Delta TVC = MC$$

Average variable cost: Total variable cost divided by the no. of units of output, a per-unit measure of variable costs

$$AVC = TVC/q$$



output decisions:- revenues and costs affect the profit-maximizing levels of output in perfectly competitive firms.

Perfect competition: An industry structure in which there are many firms, each small relative to the industry, producing identical products, which no firm is large enough to have any control over prices; here demand curve is a horizontal line (Perfectly elastic demand).

Total revenue: The total amount that a firm takes in from the sale of its product: The price per unit times the quantity of output the firm decides to produce ( $P \times q$ ).

Marginal revenue: The additional revenue that a firm takes in when it increases output by one additional unit. In perfect competition, the marginal revenue is equal to the price.

If units marginal revenue exceeds marginal costs, profits will rise. If units marginal revenue exceeds marginal costs, profits will decline.

Marginal costs exceed marginal revenue, profits will decline. The firm continues to increase output as long as price (MR) is greater than marginal cost.

Marginal cost curve is the perfectly competitive firm's supply curve in the short run.

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9. long run costs and output decisions:  
breaking even: the situation in which a firm is earning exactly a normal rate of return.
- firms cannot exit the industry in the short run. The firm can shut down, but it cannot get rid of its fixed costs by going out of business.
- If total revenue exceeds total variable cost, the excess revenue can be used to offset fixed costs & reduce losses, & it will pay the firm to keep operating.
- If total revenue is smaller than total variable cost, the firm that operates will suffer losses in exceed of fixed costs. In this case, the firm can minimize its losses by shutting down.
- shut-down point: the lowest point on the avg variable cost curve. When price falls below the minimum point on AVC, total revenue is insufficient to cover variable costs and the firm will shut down and bear losses equal to fixed costs.
- At prices, below avg variable cost, it pays a firm to shut down rather than continue operating. Thus, the short-run supply curve of a competitive firm is the part of its marginal cost curve that lies above its avg variable cost curve.
- short-run industry supply curve: The sum of the marginal cost curve (above AVC) of all the firms in an industry.
- Long-run avg cost curve: (LRAC) shows the way per unit costs change with output in the long run.
- Increasing returns to scale or economies of scale: An increase in a firm's scale of production leads to lower costs per unit produced.
- constant returns to scale: An increase in a firm's scale of production has no effect on costs per unit produced.
- decreasing returns to scale or diseconomies of scale: An increase in a firm's scale of production leads to higher costs per unit produced. The coordination function is more complex here in larger firms.

Minimum efficient scale (MES): The smallest size at which long-run average cost is at its minimum.

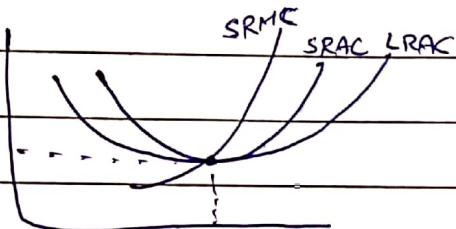
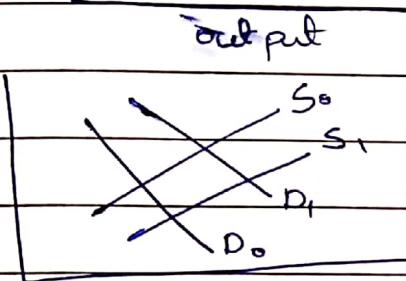
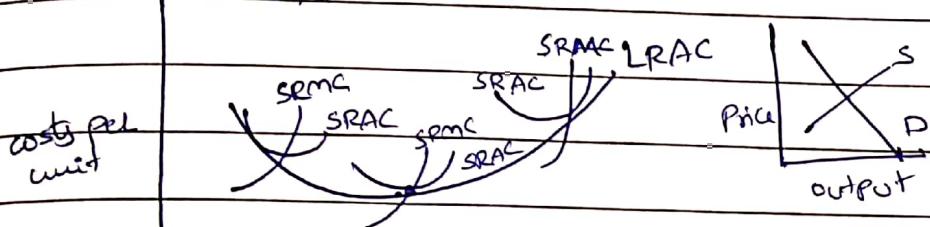
It thus seems logical to conclude that most firms face constant returns to scale at the plant level as long as they can replicate their existing plants.

Optimal scale of plant: The scale of plant that minimizes long-run average cost.

long run competitive equilibrium: - 2

firms increase output along as the new price is greater than the short-run marginal cost curve.  $SRMC = SRAC = LRAC = p$ ; Profits = 0

Rosserm



Investment: In the form of new firms & expanding old firms will over time tend to favour those industries in which profits are being made and over time, industries in which firms are suffering losses will gradually contract from disinvestment.

10. Input demand: derived demand: The demand for resources (inputs) that is dependent on the demand for the outputs those resources can be used to produce. Inputs are demanded by firm iff households demand the good <sup>Produced by firm</sup>

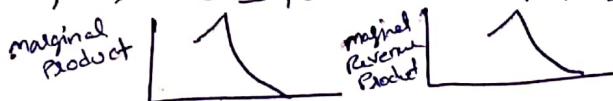
Productivity of an input: The amount of output produced per unit of that input.

Marginal product of labor: <sup>(MP)</sup> the additional output produced by 1 addition unit of labor.

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Marginal revenue product: (MRP) a value of marginal product (MP). The additional revenue a firm earns by employing 1 additional unit of an input, ceteris paribus.

$$MRP_L = MP_L \times P_x$$



Market labor supply curve: the horizontal aggregation of the individual labor supply curves for workers in an area.

Demand-determined price: the price of a good that is in fixed supply, it is determined exclusively by what households and firms are willing to pay for good

Pure-rent, the return to any factor of production that is in fixed supply.

11. Input demand: the capital market and the investment decision

Capital market: households often indirectly supply the financial resources necessary for firms to purchase capital.

Capital: those goods produced by the economic system that are used as inputs to produce other goods and services in future.

Physical or tangible capital: material things used as inputs in the production of future goods and services. The major categories of physical capital are non-residential structures, durable equipment, residential structures and inventories (honey - toothbrushes).

Social capital or infrastructure: capital that provides services to the public. Most social capital takes the form of public works (roads, bridges) and public services (Police and fire protection).

Intangible capital: non-material things that contribute to the output of future goods and services.

Human capital: A form of intangible capital that includes the skills and other knowledge that workers have or acquire through education and training and that yields valuable services to a firm over time.

Measuring capital: current market value.

Capital stock: for a single firm, the current market value of firm's plant, equipment, inventories and intangible assets.

Investment: new capital additions to a firm's capital stock. Although capital is measured at a given point in time (a stock), investment is measured over a period of time (a flow). The flow of investment increases the capital stock.

Depreciation: the decline in an asset's economic value over time.

Capital market: the market in which households supply their savings to firms that demands funds to buy capital goods.

Investment by firms is demand for capital. Saving by households is the supply of capital.

Bond: A contract b/w a borrower and a lender, in which the borrower agrees to pay the loan at some time in the future, along with interest payments along the way.



Financial capital market: the part of the capital market in which savers and investors interact through intermediaries.

Capital income: income earned on savings that have been put to use through financial capital markets

Interest: The payments made for the use of money.

Interest rate: Interest payments expressed as a percentage of the loan. Fixed rate loans are loans in which the interest rate never rises. In recent years, there have been adjustable rates of interest on savings account and certificates of deposit.

Profit: net income of a firm.

Stock: A share of stock is an ownership claim on a firm, entitling its owner to a profit share.

Functions of interest and Profit: Profit serves as a reward for innovation and risk taking.

Business loans: Banks have funds to lend only if households deposit their savings there.

Venture capital: Biotechnical, scientists.

Retained earnings: through internal funds. Firms makes its own profits & uses it to buy capital assets instead of paying it out to its stockholders (actually saving on behalf of its shareholders).

Stock market: savings from households flow into investment.

raises the funds needed by issuing shares of stocks to households.

Mortgages: like a bond, is a contract in which the borrower promises to repay the lender in future.

most mortgages bonds are made by banks & savings & loans.

Now they are now written by mortgage brokers or bankers who immediately sell these to secondary market which are run by govt agencies. Loans in this market are securitized.

Capital accumulation and allocation: all societies should exist throughout time and must allocate resources over time.

In modern industrial societies, investment decisions are made by firms. Households decide how much to save. Capital market exists to direct savings into profitable investment projects.

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Demand for new capital: expansion of existing firms & creation of new firms both involve investment in new capital

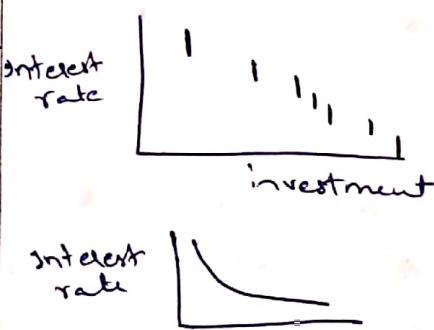
Investment decision: Even no profits, firms must still do some investing. firms invests in capital up to point at which the marginal revenue product of capital is equal to price of capital.

Firm's expectations: imp dimension of capital is time. Capital goods do not begin to yield benefits until they are used.

All firms must rely on forecasts to make sensible investment.

Expected costs of investment: firms borrows, must pay interest. If it lends, it will earn interest.

expected return rate: the annual rate of return that a firm expects to obtain through a capital investment. The expected rate of return on an investment project depends on the price of the investment.



The demand for new capital depends on interest rate. If IR is 1, firms likely to invest in new plant & equipment.

b/c interest rate determines direct cost or the opportunity cost (alternative investment) of each project.

firm will continue investing up to the point at which the marginal revenue product of capital is equal to price of capital  $MRP_K = P_K$   
B/c households & firms is the financial capital market.

20. Macroeconomics: determinants of national total output.  
national income, overall price level, total employment. sum of those  
Microeconomics: individual decisions. individual decisions.

concerns of macroeconomics:

→ output growth → unemployment → inflation and deflation

output growth: economics tends to experience short term ups and downs in their performance.

sticky prices: Prices that do not always adjust rapidly to maintain equality b/w quantity supplied and demanded.

Business cycle: cycle of short term ups & downs in the economy.

aggregate output: the total quantity of goods and services produced in an economy in a given period

recession: A period during which agg output declines. conventionally, a period in which agg output declines for two consecutive quarters

depression: A prolonged and deep recession

expansion or boom: The period in business cycle from a trough up to a peak during which output & employment grow.

contraction, recession or slump: The period in business cycle from a peak down to a trough during which output & employment fall.

unemployment rate: the % of labor force that is unemployed.

inflation: An ↑ in the overall price level.

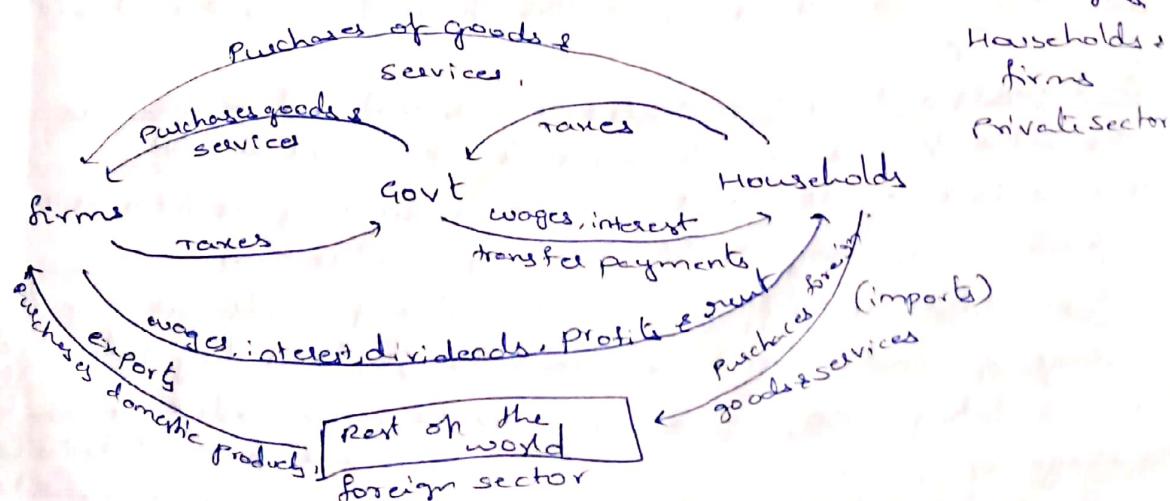
hyper inflation: A period of very rapid ↑ in the overall price level.

deflation: A ↓ in the overall price level.

The goal of policy makers is to avoid prolonged periods of deflation as well as inflation to pursue the macroeconomic goal of stability.

Circular flow diagram showing the flows in and out of the sectors in the economy.

transfer payments: cash payments made by the govt to people who do not supply goods, services or labor in exchange for these payments. They include social security benefits, veterans' welfare benefits.



impossible to sell something without there being a buyer, impossible to make a payment without there being a recipient.  
Every transaction must have two sides.

Goods & service market: firms supply; households, govt & other firm demand.

labor market: households supply, firms, govt demand.

money or financial market: Household supply funds in expectation of earning income in form of stocks, interests on bonds.

Treasury bonds, notes or bills: promissory notes issued by the federal govt when it borrows money.

corporate bonds: promissory notes issued by corporations when they borrow money.

shares of stock: financial instruments that give to the holder a share in the firm's ownership and therefore the right to share in the firm's profits.

dividends: the portion of a firm's profits that the firm pays out each period to its shareholders.

Fiscal Policy: Govt policies concerning taxes and spending.  
Govt collects taxes from firms & households & spends those funds on its capital. expansionary fiscal policy in which taxes are cut or govt spending ↑. contractionary fiscal policy is the reverse.

Monetary policy: the tools used by the Federal Reserve to control short term interest rates.

Great depression: the period of severe economic contraction & high unemployment that began in 1929 & continued throughout 1930s.

fine tuning: the phrase used by Walter Heller to refer to the govt's role in regulating inflation & unemployment.

stagflation: a situation of both high inflation & high unemployment.

## 21. Measuring national output & national income.

National income and product accounts: Data collected and published by the govt describing the various components of national income and output in the economy.

The key concept in national income & product accounts is GDP.

GDP: total market value of all final goods and services produced within a given period by factors of production located within a country.

final goods and services: Goods & services produced for final use.

The value of intermediate goods is not counted in GDP.

intermediate goods: Goods that are produced by one firm for use in further processing or for resale by another firm.

value added: the difference b/w the value of goods as they leave stage of production & the cost of the goods as they entered that stage of production.

In calculating GDP, we can sum up the value added at each stage of production or we take the value of final sales & not use the value of total sales in an economy to measure how much output has been produced.

\* GDP doesn't count transactions in which no new goods & services are produced.

exchange of stocks and bonds for money (for other stocks, shares don't involve in current production, but fees for performing such exchanges do involve.)

GDP is the value of output produced by factors of production located within a country.

output should also be produced in the country.

GNP: total market value of all final goods & services produced within a given period by factors of production owned by country's citizens, regardless of where the output produced two methods for calculating GDP.

expenditure approach: A method of computing GDP that measures the total amount spent on all final goods and services during a given period.

income approach: A method of computing GDP that measures the income-wages, rents, interests & profits-received by all factors of production in producing final goods & services.

Expenditure approach:  $C + I + G + (EX - IM)$

C. Personal consumption expenditures: households spending on consumer goods. (on goods & services)

durable goods: Goods that last a relatively long time, such as cars and household appliances.

nondurable goods: Goods that are used up fairly quickly, such as food and clothing.

services: the things we buy that do not involve the production of physical things, such as legal & medical services & education.

Goods that people sell on eBay don't contribute to GDP currently, but the cost of finding an interested buyer for those old goods does indeed get counted.

I. Gross private domestic investment:

= total investment in capital, that is the purchase of new housing, plants, equipment & inventory by the private sector.

non-residential investment: expenditures by firms for machines, tools, plants & so on.

residential investment: expenditures by households & firms on new houses and apartment buildings.

change in business inventories: the amount by which firms' inventories change during a period. Inventories are the goods that firms produce now but intend to sell later.

GDP: final sales + change in business inventories.

depreciation: the amount by which an asset's value falls in a given period.

gross investment: the total value of all newly produced capital goods (plant, equipment, housing & inventory) produced in a given period.

Net investment = Gross investment - Depreciation, an item within

If Net investment is -ve, capital stock has decreased & vice-versa.

$$\text{Capital end of period} = \frac{\text{Capital beginning of period} + \text{net investment}}{\text{line}}$$

### Govt consumption & gross investment:

Expenditures by federal, state & local govts for final goods and services.

EX-IM: Net exports. The diff b/w exports (sales to foreigners of US-produced goods & services) & imports (US purchases of goods & services from abroad). It can be +ve or -ve.

### Income approach:

National income: the total income earned by the factors of production owned by a country's citizens.

Compensation of employees: includes wages, salaries and various supplements - employee contributions to social insurance & pension funds, ex: paid to households by firms & govt.

Proprietor's income: the income of unincorporated businesses

Rental income: the income received by property owners in the form of rent.

Corporate profits: the income of corporations.

Net interest: net interest paid by business.

Indirect taxes minus subsidies: Taxes such as sales taxes, customs duties and license fees less subsidies that the govt pays for which it receives no goods or services in return. Is net revenue received by the govt.

Net business transfer payments: net transfer payments by businesses to others.

Surplus of govt enterprises: Income of govt enterprises.

Net national product: Gross national product - depreciation, a nation's total product - what is required to maintain the value of its capital stock.

Statistical discrepancy: Date measurement error.

Personal income: the total income of the households.

Disposable personal income / after-tax income: Personal income - personal income taxes. The amount that households have to spend or save.

Personal saving: the amount of disposable income that is left after total personal spending in a given period.

Personal saving rate: the % of disposable income that is saved. If this rate is low, households are spending a large amount relative to their incomes, if it is high, households are spending cautiously.

Current dollars: The current prices that we pay for goods & services.

Nominal GDP: GDP measured in current dollars.

weights: the importance attached to an item within a group of items.

base year: the year chosen for the weights in a fixed-weight procedure

fixed-weight procedure: A procedure that uses weights from a given base year.

informal economy: the part of economy in which transactions takes place and in which income is generated that is unreported & therefore not counted in GDP.

Gross National Income: GNP converted into dollars using an average of currency exchange rates over several years adjusted for rates of inflation.